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The effects of antioxidant therapy on the sperm DNA fragmentation index in male infertility: a meta-analysis = Efek dari terapi antioksidan pada indeks fragmentasi DNA sperma pada pria dengan infertilitas: Studi meta-analisis

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Abstrak

Pendahuluan: Bukti terkini menunjukkan bahwa antioksidan dalam diet dapat bermanfaat dalam mengurangi kerusakan sperma, terutama pada pria dengan tingkat fragmentasi DNA (Deoxyribonucleic Acid) yang tinggi. Penelitian ini bertujuan untuk menyelidiki hubungan antara suplementasi antioksidan dan Indeks Fragmentasi DNA (DNA Fragmentation Index/DFI) pada pria infertil.
Metode: Sebuah tinjauan sistematis dilakukan menggunakan basis data online termasuk Pubmed, Science Direct, EBSCO, dan Cochrane sesuai pedoman PRISMA. Kami hanya menginklusi uji coba terkontrol secara acak (Randomized Controlled Trials/RCTs) yang ditulis dalam bahasa Inggris. Populasi target adalah pria infertil tanpa komorbiditas, dengan intervensi berupa suplementasi antioksidan selama minimal 3 bulan.
Hasil: Pencarian awal basis data menghasilkan 447 makalah, di mana 11 makalah disertakan setelah penyaringan abstrak, dan 8 makalah dipertimbangkan untuk analisis kuantitatif. Hampir semua penelitian menunjukkan risiko bias yang rendah berdasarkan penilaian Cochrane Risk of Bias (RoB). Meta-analisis dari 8 uji coba terkontrol secara acak (RCTs) menunjukkan pengurangan DFI yang tidak signifikan sebesar -1,28% (-3,88, 1,31; p=0,33). Namun, antioksidan tertentu seperti N-Acetyl Cysteine (NAC), asam dokosaheksaenoat (Docosahexaenoic Acid/DHA), dan astaxanthin terbukti efektif dalam mengurangi DFI. Sebaliknya, seng, asam folat, laktolykopen, kombinasi vitamin C dan E, serta vitamin D3 tidak menunjukkan efektivitas dalam mengurangi DFI.
Kesimpulan: Beberapa antioksidan (NAC, DHA, dan astaxanthin) terbukti efektif dalam mengurangi indeks fragmentasi DNA, sementara seng, asam folat, laktolykopen, kombinasi vitamin C dan E, serta vitamin D3 tidak efektif. Diperlukan lebih banyak uji coba terkontrol secara acak dengan jumlah subjek yang lebih besar untuk menentukan efektivitas antioksidan.
.....Introduction: Current evidence suggests that dietary antioxidants may be beneficial in reducing sperm damage, particularly in men with high levels of Deoxyribonucleic Acid (DNA fragmentation). This study aimed to investigate the association between antioxidant supplementation and DNA Fragmentation Index (DFI) in infertile males.
Methods: A systematic review was conducted using online databases including Pubmed, Science Direct, EBSCO, and Cochrane according to PRISMA guideline. We only included randomized controlled trials (RCTs) in the study that were written in English. The target population was infertile males without comorbidities, and the intervention was antioxidant supplementation for a minimum of 3 months.
Results: The initial database search yielded 447 papers, of which 11 were included after abstract screening, and 8 were considered for quantitative analysis. Almost all studies showed a low risk of bias according to Cochrane Risk of Biasa (RoB) assessments. The meta-analysis of 8 randomized controlled trials (RCTs) showed a non-significant reduction in DFI by -1.28% (-3.88, 1.31; p=0.33). However, specific antioxidants such as N-Acetyl Cysteine (NAC), Docosahexaenoic acid (DHA), and astaxanthin were found to be

efficacious in reducing DFI. In contrast, zinc, folic acid, lactolycopene, combination of Vitamin C and E, and vitamin D3 did not show efficacy in reducing DFI.
Conclusion: In conclusion, some antioxidants (NAC, DHA, and astaxanthin) are shown to be efficacious in reducing DNA fragmentation index, while zinc, folic acid, lactolycopene, combination vitamin C and vitamin E, and vitamin D3 are not. More RCTs with larger subjects are needed to determine the effectiveness of antioxidants.